

## MITIGATING THE IMPACTS OF A GLOBAL PANDEMIC ON HEALTH, HYGIENE (PPE) AND HOME GOODS

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### **Abstract**

*Impacts of a global pandemic on health, hygiene (PPE) and home goods are reoccurring issues that happen in every country that has been infected by a global pandemic such as the COVID19 pandemic. Recent and past studies have showed that in the occurrence of a global pandemic have created widespread panic across nations which results in a crippling supply run that is essential in maintaining a country's economy and the stability of healthcare institutions. The purpose of this study is to get around the unforeseeable worst-case scenario in the occurrence of a global pandemic and instead of having more problems branching from it, there will be preventive measures that could benefit communities and the healthcare sector that was highly impacted when medical, hygiene and home supplies were at the brink of shortage.*

**Keywords:** supply, demand, panic, PPE

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### **Introduction**

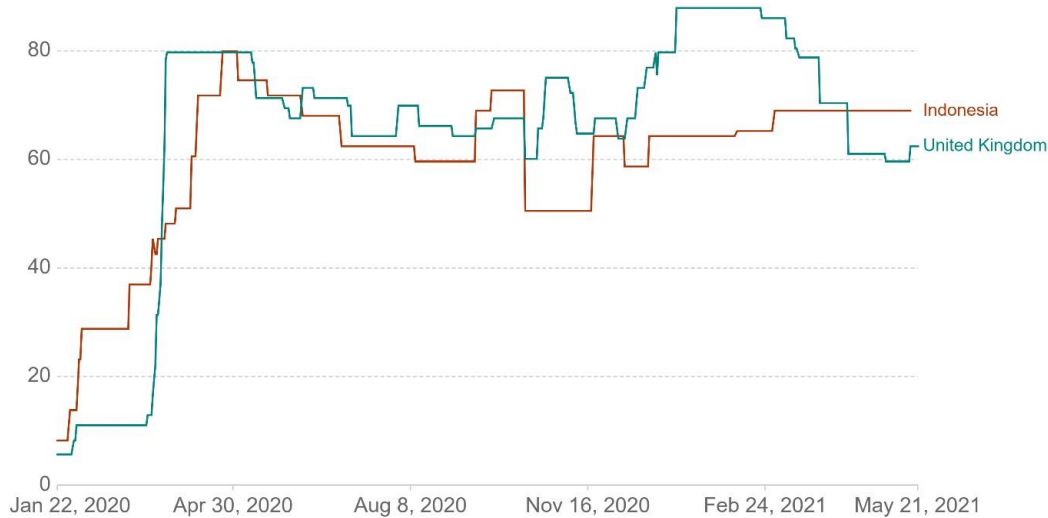
The research topic shows the problem of having to face a shortage of medical, hygiene and home supplies during a global pandemic due to the increasing demands of such commodities or goods. A global pandemic can have a huge impact towards a country's healthcare and the retail industry which can grow larger in size if a viable solution has not been discovered yet, and with an inconsistency of a monetary or fiscal policy that can stabilize rapidly growing demands, the healthcare and retail industry could hit rock bottom due to a large pressure in demands. Those are two of the many consequences of panic buying which happens in every crisis where the whole country or even the whole world is at stake such as the coronavirus pandemic, worst of all it could heavily impact those who need those goods more than anyone else who are privileged enough to have a surplus. (*Coronavirus: The psychology of panic buying - BBC Worklife*, no date) Narrowing down the research to one specific country, which is Indonesia and by determining the ongoing conditions that are within targeted healthcare institutions that are facing the many challenges and difficulties coming from the pandemic. Getting into full details by directly engaging with people who are involved in managing the supply chain within the industry and transcribing their feelings and experiences that will help in formulating a final concept that could act as a viable solution. With the past records and the continuous updates of their condition in the wake of the COVID-19 outbreak, allocating the issues and figuring out what influences each other can be done with the flick of a finger. It all starts with the government and their decisions during the early stages of an outbreak. Whatever they choose to do will undoubtedly have a cause and effect that will either spiral out of control or make the situation under control during the later stages. The graph below shows the rate of the Indonesian and United Kingdom's government's response in relation to the number of

cases, and it shows that the government's response has recently been active after a year of being in a pandemic.

### COVID-19: Stringency Index

This is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest). If policies vary at the subnational level, the index is shown as the response level of the strictest sub-region.

Our World  
in Data



Source: Hale, Angrist, Goldszmidt, Kira, Petherick, Phillips, Webster, Cameron-Blake, Hallas, Majumdar, and Tatlow (2021). "A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker)." *Nature Human Behaviour*. – Last updated 24 May, 10:17 (London time)  
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Healthcare firms, both public and private, are the first ones to act with their countermeasures against any forms of nationwide disasters such as a virus outbreak. The lives of millions of people are on the line with healthcare as the main entity that will steer the situations into a more favorable point for everyone who are affected by the pandemic. What is essential during such dire times are the commodities that are helping people avoid and prevent the worst possible outcome that could inflict short and long-term damage to themselves, the lives of other people around them or the economy as a whole in the path of a domino effect of worsening conditions. The essentials that healthcare institutions use to combat against the pandemic are personal protective equipment (surgical masks, n95 masks, gloves, hazmat, face shield), hand sanitizers, antiviral drugs, supplements, and diagnostic tools. With non-essential/medical workers sharing some of the products such as n95 face masks, face shields, and hand sanitizers.

### Problem Identification

Media coverage of the pandemic was exaggerated during the first stages because of it being a new virus that have the potential to mutate and that it is highly contagious. Thus, resulting in a global wide panic that went on for months, therefore people started hoarding hygiene products, medical and home supplies throughout the country. Not only did supplies started dropping below the level of demand of those commodities at an uncontrollably rapid pace to a point where stores have run out of supplies. Suppliers themselves could not keep up with the pace and had to outsource from other countries that do not have any issues with the staggering supplies. (Jasper *et al.*, 2020) Following the coronavirus outbreak, the price of masks in Indonesia increased fourfold, while some ventilator models were out of stock despite

distributors tripling the price. (*Shortage of medical devices such as ventilators an extreme concern: Poll*, no date)

Yet, outsourcing was not an easy process to try to fill in the unmet high demands of medical supplies and equipment at all due to the outbreak halting and limiting trading and transportation between countries. With the newly given extra steps, some operations that were essential were halted because of not being able to fulfill the requirements. There is also a risk of fraud, such as this one case where China sent supplies of health supplies and test kits, only to find them being faulty and useless. The Netherlands, Spain, Turkey, Georgia and the Czech Republic have all rejected China's supplies of medical supplies and equipment because they were proven to be faulty and useless (*China exporting faulty medical equipment as manufacturing rebounds*, no date)

Firstly, to first establish the connection between social responses and the availability of resources, we have investigated the relationship between social reaction and the availability of goods and services, all while explaining the problem by consulting with critical staff who are part of the supply chain of medical equipment used by the healthcare industry and civilians.

### Research Questions

Based on the problems that have been stated above, the questions that are needed to be answered that would formulate a viable solution in countering the problem are the following:

- Do the adverse impacts of a global pandemic have an impact on the supply and demand for hygiene and health commodities?
- Does the government's effort to preserve order in social practices and reactions by fiscal policies help balance the supply and demand for commodities?

### Research Objectives

- To figure out ways on how to avoid and prevent such disruptions.
- To learn the patterns of the spread of the virus itself in businesses, starting from external to internal factors.

### Scope and Limitations

With the ongoing pandemic right now and having travelling restrictions imposed, field study is impossible to be conducted and that the only accessible sources are the internet and contacts living in the country of interest (Indonesia). In addition to the inability to conduct any interviews with the local hospitals in the UK due to the severity of the ongoing lockdowns.

### Literature Review

#### Widespread Panic and its Effects towards the Supply

Local healthcare firms have been on the frontline during numerous natural disasters and disease outbreaks. In the occurrence of an outbreak, there are spikes in demand of medical supplies from other healthcare firms that are in the frontline and civilians themselves which are hard to meet due to a widespread panic across the country. This widespread panic was caused by the psychological affects that a worldwide crisis can incur towards people overtime because it requires at least one person's patience to thin out which could potentially affect those who are in the same crowd of people. It's already stated that the fate of other people is intertwined by the decisions and actions of the people who are instigating the problem of

scarcity by hoarding, thus leading to a butterfly effect from something as minor as not having enough toilet paper to something major such as not having enough respiratory machines to care for those who are in critical condition due to being infected by the coronavirus. As time passes and the number of cases increase, more and more people start to only think for themselves and their freedom of speech which is even worse than causing passive havoc in spreading unnecessary panic either through physical or digital means. (*Coronavirus: The psychology of panic buying - BBC Worklife*, no date) A new field of study known as misinformation studies is attempting to explain how and when false theories emerge amid public health emergencies. The latest coronavirus's media attention is now unfolding and has not been thoroughly studied. However, an analysis of two previous epidemics that occurred concurrently with the proliferation of recent news about COVID-19 demonstrates the challenge of reversing misleading rumors about a health problem. (Jasper *et al.*, 2020)

Due to manufacturing and logistics constraints caused by the panic caused by people and healthcare institutions that were hoarding PPE, the PPE supply chain has been unable to adequately respond to an increase in demand. Prices of personal protective equipment (PPE) have increased significantly since the start of the COVID-19 outbreak: sixfold for surgical masks, threefold for respirators, and a doubling for gowns (WHO 2020). Globally, production orders are backlogged by 4–6 months, and raw materials are running low. Numerous economies have imposed export restrictions on personal protective equipment and critical products. (Park *et al.*, 2020) In areas with high demand, a crucial scarcity of any of these is expected to grow or has already emerged. PPE, which was formerly commonplace and interchangeable in the hospital setting, has become a rare and valuable asset in many areas, especially when caring for pathogenic patients. Increased PPE supply in reaction to this increased demand would necessitate a significant rise in PPE sourcing, a method that many medical systems lack due to the exponential growth in COVID-19 patients. (Livingston, Desai and Berkwits, 2020). The figure below represents each of the contributing factors that have an affect on the supply of PPE in the healthcare industry:

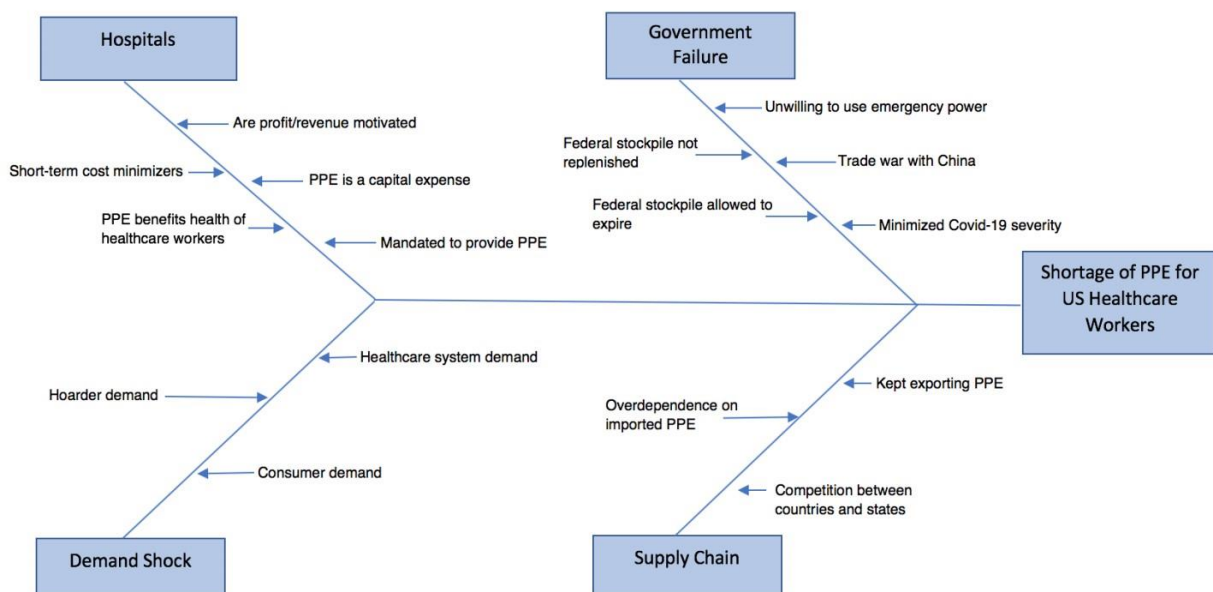


Figure 2.1 (Cohen and Rodgers, 2020)

### **Social-Political Views on Crisis**

Crisis social-political philosophy is concerned with cultural symbols and living philosophies. Specifically, crisis occurs as collectively formed relationships lose their common purpose, legitimacy, and institutionalization. Empirical research demonstrates that this disintegration process can take a variety of different forms. According to the social-political viewpoint on crisis, the root of a crisis is a systemic inability to make sense of events and structure tasks. As a consequence, social order, allegiance, and commonly held values and convictions will deteriorate, leading to an increase in excessive individualism, incivility, and violence. (Pearson and Clair, 1998) In comparison, emerging nations have a younger demographic but less developed healthcare services. The markets are lower, and state capacities are restricted. Additionally, whilst the majority of developed countries invest, borrow, and repay their loans with their own currency printed by their central bank, emerging countries would need to secure, and in most situations borrow, dollars and euros to service their debts. In brief, emerging countries' strategies in response to the pandemic will fall well short of those of developed countries. ('New Perspectives on Turkey roundtable on the COVID-19 pandemic : prospects for the international political economic order in the post-pandemic world', 2021)

### **Domino Effect and the Appearance of Disruptions by Third Parties**

The severity of the problem is worsening as many major manufacturers have lost supply of their own inventory, so many more healthcare companies have their supply chain worsened due to the lack of incoming restocks. 'Prestige Ameritech, the largest complete manufacturer of domestic operating masks, produced 600 000 masks every day, but struggled to meet demand.' (*A Texas mask manufacturer is caught in coronavirus's supply chain panic - The Washington Post*, no date) The Author highlights the gravity of the situation by the use of a six-figure number to prove that, in a global panic caused by a pandemic, a scarce commodity might reduce the productivities of medical suppliers. But, in a country with this influence, the author has said: "Mike Bowen, executive vice chair of the company, got cold calls on the telephone from people saying they served foreign governments and wanted to make big purchases." They have been able to get attention from other bodies from other countries in the same region. (*A Texas mask manufacturer is caught in coronavirus's supply chain panic - The Washington Post*, no date) The "cold calls" reveal a sense of fear on the other side of the call and again demonstrate the magnitude and global scope of the situation. However, this incident is a short-term advantage to the manufacturers and a longterm loss, since it acts as a contagion which batters them with further demand that they could not satisfy.

On the other hand, there are others that benefit other companies who are interested in their activities because of their greater local fabrication capacity in medical supplies such as China. "An enormous demand for medical supplies is holding the world's leading air cargo terminals busier than normal in the midst of the Covid-19 pandemic." (Lee, 2020) Showing the opportunistic strategy that is a win-win option both for the manufacturers of medical supplies and for the air cargo terminals in Covid-19. This was accomplished by repurposing current properties from their original intent to one that allows them to do further duplicate operations. "The substantial increase in business is largely due to the fact that freight carried by commercial aircraft had to be diverted to carriers when major airlines drastically cut or ceased flight." (Lee, 2020)



Another intriguing aspect of contagion is that it is not only limited to countries with strong economic or political relations. Psychological considerations, economists, analysts, and politicians have long argued, can be crucial in the international dissemination of crises. We believe that the ostensibly "psychological" causes should be rationalized. (Chen and Suen, 2016)

### **Crisis Management**

Combating the humanitarian problem and challenge to justice posed by coronavirus in our communities is a time-consuming and multi-level endeavor. The crisis affects every level of society, from individuals to whole countries. The same is true for both short- and long-term effects and changes. As a result, the social crisis must be understood and discussed both in the short and long term. (Haase, 2020) Collaboration, teamwork, networking, and knowledge exchange are needed to resolve such a crisis. The procedures include the dissemination of current crisis files, 24-hour meeting points, analytical reports, and a web portal for knowledge exchange and collection. These activities can be carried out incrementally in three distinct operating modes: surveillance, knowledge exchange, and a hybrid of the three. (Goniewicz *et al.*, 2020) Crisis management scholarship outlines and discusses social responses to crises including a challenge to basic beliefs, a sense of urgency to respond, and confusion about the crisis and appropriate courses of action. (Punch, 1991) These circumstances not only present critical leadership problems in terms of decisionmaking, public knowledge, sense-making, transparency, learning, and change, but also necessitate broad cooperation and teamwork affecting various individuals and organizations. (Boin, Ekengren and Rhinard, 2014) Crisis intervention and management are inextricably linked to (1) national policy, including their substance, (2) the relationships of people, organizations, coalitions, and networks, and (3) structural factors, such as income distribution, local relationships, and global policy decisions. (Weible *et al.*, 2020)

Responses take place on both the political and organizational grounds. The approach to and handling of crises takes place on two occasions. (Boin and 'T Hart, 2010) The organizational level applies to decisions and activities made on the field, and it encompasses medical practitioners, epidemiologists, emergency managers, and other experts tasked with responding to the pandemic's imminent challenge. The strategic level is comprised of political-administrative leaders who bear political accountability for and make strategic decisions, provide public reports of activities, and facilitate teamwork and cooperation. The constant need for change in crisis prevention and management in response to changing conditions and incidents necessitates continued commitment at all levels. (Weible *et al.*, 2020)

Decisions should be taken with public health in mind, not political or economic expediency. Regrettably, many decisions taken during the ongoing crisis were motivated by political and economic concerns rather than concerns about public safety and stability. As a result of the late involvement in crisis management and inability to adopt critical social distancing techniques, the outcome was compromised, resulting in the loss of life and reputation. (La *et al.*, 2020) Studies integrating social sciences into the epidemic response complement clinical trials on COVID-19. The social sciences are intended to yield rich and comprehensive insights into the social, behavioral, and contextual facets of cultures, environments, and populations impacted by infectious disease epidemics. The ultimate goal is to integrate social science and biomedical awareness about the COVID-19 outbreak. This linkage will bolster responses at the foreign, federal, state, and local levels aimed at containing the spread of COVID-19 and

mitigating its social and economic consequences. (*A COORDINATED GLOBAL RESEARCH ROADMAP: 2019 NOVEL CORONAVIRUS*, 2020)

### **Performance Intelligence and Governance of the Supply of PPE**

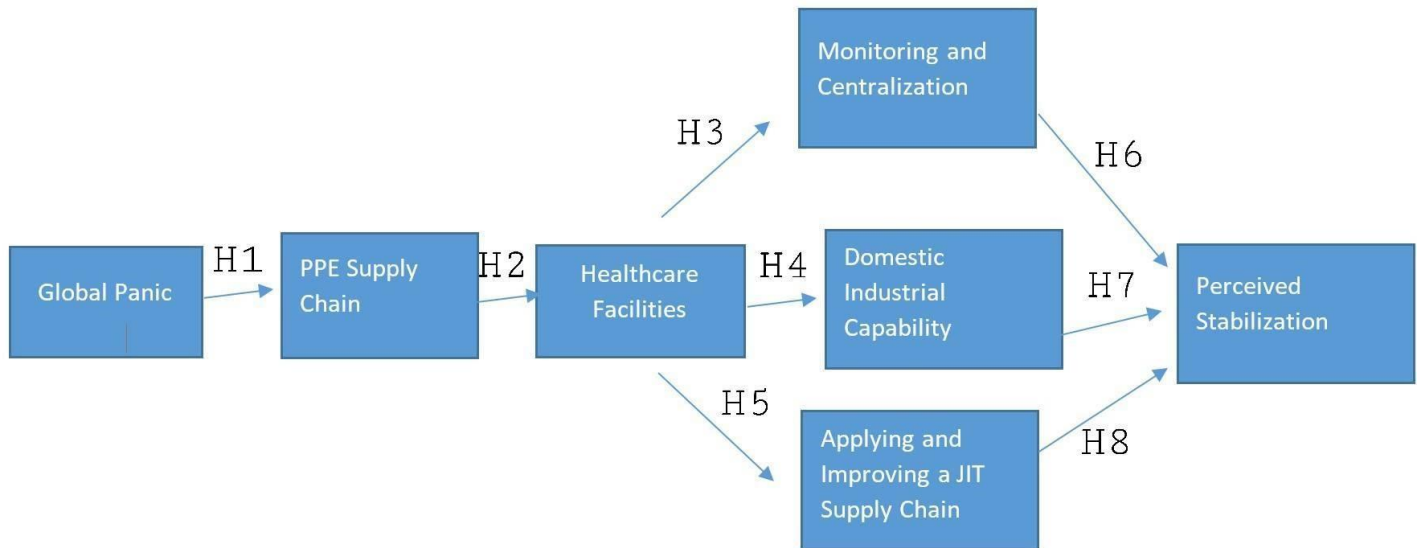
With the assistance of notified bodies, national authorities should exchange best practices and seek consensus on common methods for evaluating the safety and performance of medical devices and personal protective equipment. Member States should provide a single point of contact for all issues concerning personal protective equipment and medical devices in order to facilitate communication between testing laboratories and relevant market surveillance authorities. (*Coronavirus response / European Commission*, no date) Businesses should concentrate their efforts on making life-saving medical equipment, avoiding shortages or delays at a time when lives are at risk. Additionally, lowering barriers to access medical equipment and supplies is encouraged by eliminating customs, taxes, and VAT on medical devices and personal protective equipment imported from low-income countries. (Sohrabi *et al.*, 2020)

The solutions for PPE are slightly different. State governments could encourage enterprises to make this equipment in their communities that could shift production to that. The EPP components are complicated, but they do not require the intense capital required by ventilators, so that smaller regional businesses can play an essential role in bridging the gap. State partnerships with these firms will require cleverness, meaningful resources and relaxation of regulatory requirements of less importance. (Ranney, Griffith and Jha, 2020) Another solution would be the procurement of facemasks and other personal protective equipment (PPE) in a joint public procurement process. For example, on March 19, 2021, the EU Commission established rescEU stockpiling, a European-wide repository for medical devices such as ventilators, personal protective equipment, wearable masks, vaccines and therapeutics, and laboratory supplies. The reserve is funded to the tune of 90% by the EU Commission. This could also be adopted in Indonesia in order to have that equipment on standby during emergencies. (*Public health / European Commission*, no date)

Monitoring personal protective equipment (PPE) usage and delivery, as well as centralizing visibility of orders placed. Which will assist in ensuring the timely distribution of patient care during an emergency response and will allow distributors and retailers to identify duplicate orders and predict product demand at the national, regional, and global levels more accurately. Power for surges can be enhanced, whereas trade and logistics assistance can be prioritized through pandemics. Improving the infrastructure of just-in-time supply and distributing accountability. Foreign, national, and local stockpiles can be designed to meet the demands of an acute disease, or pandemic, while processing capability can be increased to satisfy PPE supply needs. While it is much easier to import additional supplies from other countries during outbreaks in a single region, such control becomes much more complex during pandemics, when all countries are affected. Increasing domestic industrial capability in the case of an emergency.

Lastly are some internal and external policies that can be implemented to further improve the stability of the supply chain. Government health programs must be evaluated prior to the occurrence of epidemics or pandemics. Sharing knowledge and engaging on a consistent basis. It is essential to create a reliable, lowburden system for governments and private sector stakeholders to exchange situational and supply information. (Park *et al.*, 2020)

## Theoretical Framework



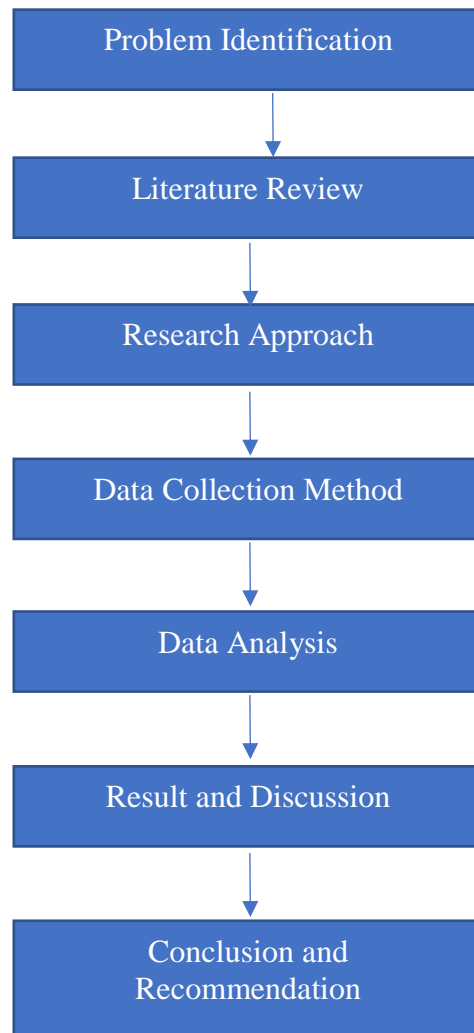
- H1: Global panic has a negative influence on PPE Supply Chain  
H2: PPE Supply Chain has a negative influence on Healthcare Facilities  
H3: Healthcare Facilities initiate “Monitoring and Centralization”  
H4: Healthcare Facilities initiate “Domestic Industrial Capability”  
H5: Healthcare Facilities initiate “Applying and Improving a JIT Supply Chain”  
H6: Applying and Improving a JIT Supply Chain has a positive influence on Perceived Stabilization  
H7: Domestic Industrial Capability has a positive influence on Perceived Stabilization  
H8: Applying and Improving JIT Supply Chain has a positive influence on Perceived Stabilization

## Research Methodology

### Research Design Flowchart

The section here shows a representative diagram of the research process which can be seen below in Figure 3.1. It includes all of the steps required in the formulation of a conclusive hypothesis.





*Figure 3.1 Research Design Flowchart*

## Research Approach

### Qualitative and Correlation Approach

The qualitative approach is to be used to allocate primary data that can be easily transcribed. The correlation research design is also being used during the thematic analysis to determine the influences between each value and to compare the correlation between each theme.

## Data Collection

### Interview

#### Company Background and Chosen Interviewee

The chosen interview participant has been determined from working with the targeted company, RS Kurnia. Kurnia Hospital is a private healthcare firm with two branches located in Serang and Cilegon in the Banten region of Indonesia. RS Kurnia Cilegon is a development of RSIA Kurnia Cilegon. Kurnia Hospital Cilegon started its operational activities in 1982 under the name Kurnia Maternity Home for 21 years. (RS Kurnia Cilegon, no date) The selected interviewee will be a Medical Support staff member who works in the hospital and will be providing the primary data necessary to be analysed.

### Data Analysis and Tools Used

For the data analysis, the thematic analysis approach is used since the data collected is qualitative data and that Due to the informative and exploratory aspect of the findings discussed in this article, content analysis was used as the primary method for analysis.

Table 3.2.4 Thematic Analysis

Themes	Code Sets	Values and their Relationships		
Comparison	Negative	Higher prices of PPE	Lower number of visitors	
Limitations	Difficulties and Challenges	PPE difficult to find on the market, higher price, competing with other health facilities	Decrease in number of visits, decrease in income	Longer supply needs
	Supply chain issues	Allocation of supplies, high demand, and low supply	Operational costs increase	Longer supply needs, not all ordered units will be fulfilled, units are limited
Involvement	Policies	Covid-19 Handling Team, Covid-19 Clinical Practice Guidelines, Hospital Infection Prevention and Control Policies, modification of Covid-19 Special Isolation Care Rooms	Minimum and maximum stock policy for each unit	
Feeling	Attention	Management of new disease	Calculated more than usual	Regularly follow-up orders, tighten PPE usage, work and patient safety
	Hopefulness	Supply chain began to stabilize in early 2021	Can be fulfilled for daily operations	Everyone hopes that this pandemic will end soon

	Uncertainty	Worried, "Even if"	"Quite a long time"	
	Hopelessness			Prices cannot be negotiated

Obstacles that were faced during this stage of the research was the constant try-outs in contacting different contacts to interview but due to the lockdown restrictions, the list of contacts have been reduced to one contact. Another obstacle was the attempt to utilize 3<sup>rd</sup> party tools such as "CATMA" which took too long to implement the thematic analysis; therefore, Microsoft Excel was used to implement the thematic analysis.

This method of analysis is effective due to the ability to finally get a clear idea of what are the correlating variables that the interviewee has mentioned throughout the interview. Also having to relate back to the literature review, there are some shared similarities such as the correlation between the high demand of PPE and its rising cost.

## Results

The reason why comparing current conditions (COVID-19) with previous conditions (pre-COVID) was to provide an outlook as to how the company has been negatively impacted by the pandemic; with the higher prices of PPE influencing the difficulty on trying to find available sources of PPE in the market. As a result of market and government shortcomings, PPE procurement by hospitals, service providers, companies, individuals, and governments became more competitive and time and money consuming. (Cohen and Rodgers, 2020) Which also contributes to the lower number of visitors because of their lack of confidence and trust with the hospital's safety for their visitors, thus decreasing the hospital's income. About half of all Britons are afraid to visit a hospital, amid physicians' promises, a recent study shows.

They risk contracting COVID-19 and being a strain on the NHS. Due to the possibility of contracting COVID-19, 45% of respondents expressed fear of visiting A&E, 41% expressed fear of attending a hospital doctor consultation, and 45% expressed fear of contracting the virus if they visited the dentist. By contrast, just 27% expressed apprehension of a visit to the pharmacist for this cause. (*Half of British public 'scared' of going to hospital due to COVID-19 risk and time-wasting - PharmiWeb.com*, 2020)

## Discussion

The results imply the direct connections between the all the different themes that were explored during the thematic analysis process. From the comparison of conditions to the feelings of the interviewee and, of course, internal policies (such as the introduction to new standards of procedures within the company) and the supply chain's stability. Such as forming guidelines

that helps those working in the supply department to determine the minimum and maximum stocks for each unit, which will help the company in tightening their usage of the PPE in order to reserve some in case of emergencies. Also paying a lot of attention to any sort of updates in regard to the disease that will help them in forecasting future supply runs, and to avoid any potential shortages. In addition to the constant follow-ups of each orders the company made to their various suppliers. This would lead to a competitive advantage, keeping a close-knit with their suppliers, In the face of other healthcare institutions that are also competing to obtain the supply of PPE that they need. This would eventually cover the three months resupply intervals that were changed from only just one month during pre-covid.

Nonetheless, the results are to be expected and that they share the same characteristics with some of the explored literature reviews. Thus, making them consistent with the previous studies that have been discussed.

## Conclusion

However, the results cannot tell what the conditions are in other countries that were supposed to be included in the data collection process. It also does not include the ways to how a government can help in producing policies that would help healthcare institutions such as RS Kurnia, because of the lack of information provided by the interviewee in regard to those external policies and the unavailability of those data from other sources that does not require a translation. Since the only source of primary data was from one participant, it can be deducted that the data is highly generalized to the environment that surrounds the company and the participant herself. Which implies that there is some information that are expected to not connect with some of the previous studies that have been explored in the literature review section. Despite the generalization, the research has proven that there is a strong connection between social behaviours and the supply and demand of essential goods. Last thing that should be pointed out is that healthcare institutions should focus more on the safety of their employees and patients because they are what keeps the company running and not just the supply chain of devices or equipment that can be obtained comparatively less difficult.

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